8.0 FINAL REGULATORY FLEXIBILITY ANALYSIS AND REGULATORY IMPACT REVIEW

This chapter contains some of the analyses required by the Regulatory Flexibility Act (Reg Flex Act) and Executive Order 12866 (E.O. 12866). Section 3 of this document and Chapter 7 of the HMS FMP contain a brief description of these laws. Section 1 of this document provides additional information on the need for and objectives of this regulatory action. Section 7 of this document contains the rest of the analyses and discussions for each alternative. This section uses logbook and dealer data to estimate the net effect of closures on fishermen's and dealers' gross revenues. In addition, the fishing costs associated with closures and any impacts on the recreational community are discussed qualitatively. The economic impacts of the other alternatives are also examined.

8.1 The Need for Action and the Objectives of this Regulation

Management of the U.S. pelagic longline fishery in the Atlantic Ocean and surrounding waters has historically relied upon catch or landing quotas and minimum size limits. Swordfish are currently managed with both quotas and a minimum size. Yellowfin and bigeye tunas are also subject to minimum sizes, although no quotas are currently in effect. Atlantic sharks are managed with quotas. Pelagic longline fishermen are prohibited from retaining numerous species including marine mammals, turtles, and billfish. Bycatch of undersized swordfish, billfish, and sea turtles has been a concern for many years because of its impact on the stocks of these non-targeted species. In September 1997, NMFS submitted the first report, entitled "A Report to Congress: Status of Fisheries in the United States," which designated North Atlantic swordfish, Atlantic blue marlin, Atlantic white marlin, bluefin tuna, and the large coastal shark complex as overfished; west Atlantic sailfish and bigeye tuna were added to the overfished stock list in 1998 and northern albacore tuna in 1999. In order to rebuild these stocks, fishing mortality must be reduced from all sources, including bycatch and incidental catches in commercial fishing gear. The Magnuson-Stevens Act defines bycatch as:

> "...fish that are harvested in a fishery, but are not sold or kept for personal use, and includes economic discards and regulatory discards. [Bycatch] does not include fish released alive under a recreational catch and release fishery management program."

Under National Standard 9, NMFS must:

> "..., to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch."

As described in Section 1, the objectives of these regulations are to:

(1) maximize the reduction in finfish bycatch;
(2) minimize the reduction in the target catch of swordfish and other species;
(3) consider impacts on the incidental catch of other species to minimize or reduce incidental catch levels; and,
(4) optimize the survival of bycatch and incidental catch species.

This document describes a full range of viable fishery management alternatives that could address these objectives including status quo, prohibiting the use of pelagic longline gear, time/area closures, prohibiting live bait, changes in setting the gear, and changes in the type of gear. The alternatives considered are summarized in Section 2 and their impacts are described in Section 7.

NMFS made a number of assumptions in analyzing these alternatives. First, likely actions which pelagic longline fishermen might take if the preferred alternative is implemented were identified and defined. These actions were identified to show the maximum economic impact these alternatives could have on pelagic longline fishermen. Second, each action was analyzed as if all participants would follow that behavior. The activities of the vessels are diverse and it is unlikely all vessels would pursue the same future actions in response to the final actions. Nevertheless, these analyses can be used as a tool to estimate and examine the possible impacts. Additional impacts, either negative or positive, might occur.

Time/area management measures have social and economic effects on individual fishermen and their communities both within and outside of the regulated area. Determining the level of impact from a time/area closure is a challenge, as it is difficult to predict how fishermen would respond to such closures, which are a relatively new tool in Atlantic HMS management. Indeed, once time/area closures are implemented, any impacts must be closely monitored in order to consider necessary adjustments.

In addition, NMFS received comments that the time/area management measures will have large economic impacts on the recreational sector. In response, NMFS has increased the discussion of the possible impacts of the time/area closures on this sector of the fishery.

8.2 Description of the Small Entities which Might be Affected by this Regulation

NMFS believes that all pelagic longline permit holders should be considered small entities. In May 1999, NMFS began the process of issuing limited access permits to qualifying fishermen for participation in the Atlantic swordfish, shark, and pelagic longline sector of the Atlantic tuna fisheries. A description of the requirements for qualifying for these permits is contained in Chapter 4 of the HMS FMP. The deadline for applying for a directed or incidental limited access permit was September 1, 1999. The initial regulatory flexibility analysis (IRFA) presented in the proposed rule used the 443 fishermen who had received either a directed or incidental swordfish

limited access permit and a tuna longline permit as of October 28, 1999. Additional applications and appeals have since been processed. Additional appeals may continue to increase the number of permit holders slightly. This final regulatory flexibility analysis (FRFA) uses a list updated as of March 23, 2000. This updates the number of vessel permit holders to 450. With these three permits, these 450 fishermen may target swordfish (if they have a directed swordfish permit), Atlantic tunas, or Atlantic sharks (if they have a directed shark permit) with a pelagic longline. If they have an incidental swordfish or incidental shark permit, these fishermen could still target Atlantic tunas. If they have a permit but chose not to fish, they may sell their permits; thus, these regulations have a potential impact on these "latent" permit holders. Thus, the number of small entities directly affected by this regulation consists of at least these 450 fishermen. This number does not include the vessel captains or crew members who might also be impacted by this regulation. In addition, this number does not include the number of vessel owners who hold only shark limited access permits. This is because fishermen who hold only shark permits can use gear other than pelagic longline, such as bottom longline, and are not allowed to land swordfish or tunas; thus, they are not directly affected by the final regulations.

In addition, other sectors of the commercial fishery might be affected by this regulation, including dealers, processors, bait houses, and hook manufacturers. NMFS does not have the information to estimate the number of all the businesses which might be directly affected by the regulation. However, using the weighout slips submitted by fishermen reporting in the pelagic longline logbook, NMFS estimates that 125 dealers received fish in 1998 from the 450 fishermen who qualify for limited access. This estimate is a minimum estimate as a number of fishermen might use other logbooks or might not have caught fish in 1998 (the year used for these analyses). These numbers have also changed from the IRFA. The IRFA found that in 1997, 131 dealers had received fish from the 443 vessels.

NMFS received comments that the recreational and charter/headboat sectors of HMS fisheries may also experience economic impacts as a result of the time/area closures. At this time, NMFS only has HMS recreational permits in the Atlantic tunas fishery (Angling category). There were over 10,000 permit holders in this category in 1998. NMFS also has a charter/headboat category permit for Atlantic tunas and is working towards implementing HMS permits for all charter/headboat owners. As described in the 2000 SAFE report, the Large Pelagic Survey estimates that there were over 11,000 charter/headboat trips and over 58,000 private recreational trips targeting large pelagic species with handgear from June through October in 1998. Fisher and Ditton (1992) estimated that in 1989 there were 7,915 U.S. tournament billfish anglers. NMFS also now requires HMS tournaments to register and selected tournaments to report. Although NMFS has improved the management of HMS recreational fisheries, work needs to be done before NMFS can estimate the number of recreational fishermen and the number of small entities (e.g., charter/headboats) that rely on recreational fishermen and that may be affected as a result of these regulations. Although NMFS cannot provide an estimate of the number of recreational fishermen who target HMS, NMFS believes that recreational fishing is important for many fishing communities and that any increase in the available stocks could result in an increase in angler willingness to pay and thus, net economic benefits to the nation. For more

information regarding the importance of the recreational fishing sector in HMS fisheries, please see the HMS FMP and Billfish FMP Amendment.

8.3 Description of the Compliance and Reporting Requirements

This regulation would not change the reporting requirements of the fishermen and dealers involved. Instead, this regulation changes the areas in which fishermen can use pelagic longline gear and will restrict fishermen to using dead bait. These changes should not change the skill level needed to participate in the fishery, but might have a significant impact on the variable costs, especially in the short term, required to remain in the fishery.

8.4 Relevant Federal Rules which Might Conflict with this Regulation

As described in the HMS FMP and in this document, fishermen, dealers, and managers in this fishery must comply with a number of international agreements, domestic laws, and other FMPs. These include, but are not limited to, the Magnuson-Stevens Act, the Atlantic Tunas Convention Act, the High Seas Fishing Compliance Act, the Marine Mammal Protection Act, the Endangered Species Act, the National Environmental Policy Act, the Paperwork Reduction Act, the Coastal Zone Management Act, and the United Nations Agreement on Straddling Fish Stocks (signed by the United States, but not entered into force). NMFS strives to ensure consistency among regulations with the Fishery Management Councils and other relevant agencies. NMFS does not believe that the regulations implemented in this document conflict with any relevant regulations, federal or otherwise.

8.5 Final Regulatory Flexibility Analysis

The following sections contain the bulk of the FRFA. Other sections in this document, particularly Section 7 and Section 8.6, contain additional descriptions of possible economic impacts of the various alternatives along with the possible environmental, ecological, and social impacts of each alternative.

8.5.1 Materials and Methods for Gross Revenue Analysis on Time/Area Closures

The evidence collected by NMFS and used in these analyses indicates that the majority of pelagic longline fishermen not only carry fishing permits for other fisheries, but also participate actively in other commercial fisheries. These observations are based on information contained in several NMFS databases and on comments received during the rulemaking on limited access and during this rulemaking. The data used for these analyses support these observations and indicate that dealers also operate in a number of commercial fisheries. For instance, of the 329 fishermen with swordfish limited access permits who held non-expired permits according to the Southeast Regional Office's database as of May 9, 2000, approximately half held only a shark and swordfish permit. The other fishermen held a range of permits including king mackerel, Spanish

mackerel, golden crab, reef fish, red snapper (both Class 1 and Class 2 licences), rock shrimp, snapper-grouper, and spiny lobster. In addition, some of the vessel permit holders held permits that are managed by the Northeast Regional Office including multispecies, scup, squid, mackerel, butterfish, and dogfish.

Dealers also participate in a number of fisheries. According to the dealer database maintained in the Southeast Regional Office, of the 372 dealers who held a swordfish permit as of May 5, 2000, only 117 held only a swordfish dealer permit. Other dealers held a range of permits such as reef fish, snapper-grouper, rock shrimp, shark, wreckfish, and golden crab. In addition, many of the 372 dealers also held permits maintained in the Northeast Regional Office including Atlantic tunas, multispecies, scallop, American lobster, scup, squid, mackerel, butterfish, surfclam/ocean quahog, black sea bass, monkfish, and dogfish. Thus, fishermen and dealers who could be significantly impacted by this action might be able to redirect fishing or processing activities to other fisheries. However, given the overfished status of many stocks, NMFS recognizes that this option might not be feasible.

NMFS' permitting and reporting requirements for HMS and other fisheries provide information about the volume and species of fish caught and landed by vessels, and the ex-vessel price received for the species landed. From these records, the average weight of each species landed and the average ex-vessel price received for each species can be calculated. Using these averages, the gross revenues of vessels that land HMS can be estimated.

Information about costs, however, is not collected under these mandatory reporting requirements at this time. In October 1999, NMFS announced its intention to make the collection of costs and earnings economic information mandatory for selected vessels (64 FR 55900). At this time there are limited costs data available from NMFS-sponsored studies and a voluntary economic form on pelagic logbooks. Studies on these data have several shortcomings. First, they tend to cover only a portion of the vessels affected by this final rule. Second, the studies present cost averages rather than vessel-specific costs. As a result, NMFS' cost data are not as comprehensive as NMFS' revenue data, and the average cost data are not directly comparable with the vessel-specific revenue data.

The process NMFS used to obtain the gross revenues of vessels using 1998 data are described below. Except for step 2, this is the same process as that used in the IRFA.

1. The average ex-vessel price and dressed weight for swordfish, bluefin tuna, yellowfin tuna, bigeye tuna, other tunas, large coastal sharks, other sharks, shark fins, dolphin, wahoo, and other fish were calculated using the weighout slips reported with the pelagic logbook and with information collected under the Southeast General Canvass Program (Table 8.1). Both databases are maintained by the Southeast Fisheries Science Center. NMFS recognizes that there are regional and seasonal differences in prices but does not believe that using these different prices would change the results of the analyses significantly.

2. For each vessel that qualified for either a directed or incidental swordfish limited access permit, NMFS calculated the number of fish reported landed by species. This step was done for each vessel, all of its landings, and for its landings in each closed area. This step used a number of databases. Most of the qualifying fishermen reported their landings by number in the pelagic logbook maintained by the Southeast Fisheries Science Center. NMFS found that in 1997, some fishermen reported landings in logbooks maintained by the Northeast Fisheries Science Center but not in the pelagic logbook. Re-analyzing the data for the FRFA, NMFS found that most of these fishermen fished in areas north of the closed areas and would not be directly impacted by the closures. Thus, NMFS did not consider landings reported in these other logbooks for the FRFA. This may result in the analyses indicating fewer active fishermen. However, this may be explained by a change in methods, not in a decrease in the number of active fishermen. Because the percentages are based on the number of fishermen who landed fish and qualified for an incidental or directed limited access permit, this change in method will not have a significant bearing on the results.

3. NMFS then calculated the total gross revenues for each vessel. The gross revenue was estimated by multiplying the number of fish landed by each vessel by the average weight and by the average fleet-wide ex-vessel price. The total gross revenue for each vessel was calculated by adding the revenue received for all species.

4. NMFS then subtracted the gross revenue received in the closed area from the total gross revenue calculated for each vessel for 1998. The estimates for total gross revenue assumes there is no time/area closure. This step estimates the revenue that might be lost to each vessel if a particular area is closed.

Once these four steps were completed, NMFS counted the number of vessels which were impacted by closing certain areas and times. This analysis estimates the *maximum* negative impact of the closures on vessel owners for three reasons: 1) it assumes that vessels that normally fish inside the closed area do not move outside the area, 2) it assumes that the sets made in the closed time/area are not made elsewhere in time or area, and 3) it assumes that vessels that fish outside the closed area do not land any additional fish even though the quota could still be available. In other words, this analysis is the economic counterpart to the no effort redistribution model used to calculate the ecological impacts in the previous section. It calculates the maximum impact to vessels because it assumes vessel owners would not adjust to the time/area closure, would stop fishing, and that there is no subsequent increase in effort elsewhere or at other times by that vessel or any other vessel. Thus, the analysis does not consider that some vessels might experience positive benefits as a result of this action. However, this analysis does not calculate the impact on captains or crew members other than the change in gross revenues which is related to the captain and crew share.

NMFS received comments suggesting that NMFS use an equivalent of the effort redistribution model used in the biological analyses. Under that type of model, NMFS would assume that all fishermen would continue to fish and could land an equivalent number of, or maybe more, fish

than they do with no closures. This model would indicate that commercial fishermen would experience few, if any, negative economic impacts and may experience some benefits. Although this result is possible, NMFS does not believe this type of model is realistic. Instead, NMFS believes it is best to consider the worst-case scenario.

In addition to calculating the change in gross revenue for each vessel that qualified for an incidental or directed swordfish limited access permit, NMFS attempted to calculate the change in revenues for dealers who bought fish from the qualifying vessels. For this part of the analysis, the total weight sold to each dealer, by species, from each qualifying vessel was calculated using the weighout slips reported to the Southeast Fisheries Science Center. The weight for swordfish and yellowfin tuna was multiplied by the average wholesale price ($4.79 and $5.73, respectively) to calculate the gross revenue from those species for each dealer both before and after the closure. The average wholesale price was obtained from the 1998 data for the Fulton Fish Market for sales which occurred in east coast states. This database does not contain enough information to calculate the wholesale price for all species. NMFS will continue to collect any information on wholesale prices for future analyses. For all species, this analysis examines the impact of a closure on the total weight of fish sold by each dealer.

As with the vessel gross revenue calculations above, the analyses for dealers provide an estimate of the maximum impact this action might have because it does not consider dealers changing the proportion of the species they buy or import, or possible increases in fishing effort and harvest and sale to dealers located near the open areas. In other words, this analysis does not consider that dealers, like fishermen, may make adjustments to their operations so as to offset the effects of the time/area closure and does not examine the offsetting positive impacts that might accrue to some dealers. In addition, examining the total pounds of fish sold by each dealer can indicate patterns but does not indicate the actual impact of a closure. Losing 10 percent of fish might have a large impact if that 10 percent is comprised of fish that are relatively high-priced (i.e., yellowfin tuna). On the other hand, for some dealers losing 10 percent of fish by weight might have little impact if that portion is comprised of fish which are worth little compared to other fish (i.e., shark meat).

Some comments noted that NMFS should use net revenues instead of gross revenues for these calculations. At this time, cost information for each individual permit holder and dealer is not available. NMFS does have an estimate of the average variable costs for permit holders but does not have an estimate for dealers. However, subtracting this average from every estimate of gross revenues from every vessel is the same as subtracting a constant and would not change the results. Thus, at this time, NMFS addresses gross revenues and fishing costs separately. Once mandatory economic data collection is in place, NMFS will have better, individualized cost data and will be able to conduct analyses on net revenues.

Table 8.1 The 1998 average ex-vessel price and weight information used to estimate each vessel's gross revenue. Data reported to the Southeast Fisheries Science Center.

Species	Average Weight (lb dw)	Standard Error	Average Price ($/lb dw)	Standard Error
Swordfish	71.77	0.55	$3.03	0.04
Bluefin tuna[1]	606.69	--	$3.91	--
Yellowfin tuna	60.29	0.39	$2.18	0.03
Bigeye tuna	67.64	0.70	$2.68	0.07
Other tunas	31.06	0.40	$0.73	0.02
Large Coastal sharks	40.36	1.49	$0.56	0.02
Other sharks	90.82	1.67	$0.71	0.02
Shark fins[2]	--	--	$13.96	0.33
Dolphin	16.16	0.15	$1.68	0.01
Wahoo	27.78	0.43	$1.97	0.02
Other fish	24.58	0.41	$0.97	0.01

8.5.2 Results of Gross Revenue Analysis on Commercial Vessels

Of the 450 permit holders who qualified for a swordfish directed or incidental limited access permit, 242 did not report landings in the pelagic logbook.[3] The fishermen who did report in the pelagic logbook in 1998 had estimated gross revenues ranging from $435 to $668,135 with an average of $137,126 per permit holder. This is an increase from the average gross revenues presented in the IRFA using 1997 data but a decrease in the range of values. Those data demonstrated that the gross revenues for each vessel from all fishing ranged from $82 to over $4 million and averaged $113,173 per permit holder.

Four hundred and thirteen permit holders did not report landings of fish caught within the DeSoto Canyon area. With this closure, NMFS estimates that only one vessel owner, who reported landings, may not report any landings. In other words, only one vessel fished exclusively in this area. The estimated percent change in gross revenues for vessels if the DeSoto Canyon area is closed year-round is shown in Table 8.2. The analysis estimates that

[1] Average weight and price taken from the HMS FMP.

[2] Based on the ratio of wet fins to carcass weight (CFR § 635.30 (c)(3)), the shark fin weight used was based on 5% of the landed shark weight.

[3] The limited access qualifications did not stipulate that vessels land fish in 1998. Instead, vessel owners needed to show that they held a valid Federal swordfish permit at any time between June 1, and November 30, 1998. Therefore, NMFS did not expect that all qualifiers would have landed fish in 1998. In addition, all limited access qualifiers were not required to report landings in the pelagic logbook.

approximately 13 percent of the vessels that reported landings in 1998 would experience at least a 5 percent decrease in gross revenues when the DeSoto Canyon is closed. Approximately 4 percent of the vessels would experience at least a 50 percent decrease in gross revenues (i.e., be forced out of business). The fishermen who reported landings from the DeSoto Canyon area in the pelagic logbook in 1998 had estimated gross revenues from the DeSoto Canyon ranging from $681 to $84,959 with an average of $17,254 per permit holder. With the DeSoto Canyon closure alone, NMFS estimates that the average gross revenue per permit holder from all landings will decrease by 1.8 percent to $134,705.

The economic impacts on vessel gross revenues of the DeSoto Canyon area are estimated to be less than the expected economic impacts of the proposed Gulf B closure. Using 1998 data, NMFS estimated that approximately 23 percent of the vessels that reported landings in 1998 would experience at least a 5 percent decrease in gross revenues if the Gulf B area is closed. Approximately 5 percent of the vessels would experience at least a 50 percent decrease in gross revenues (i.e., be forced out of business). The fishermen who reported landings from the Gulf B area in the pelagic logbook in 1998 had estimated gross revenues from Gulf B ranging from $1,799.85 to $109,910 with an average of $34,650 per permit holder. If NMFS closed Gulf B, NMFS estimates that the average gross revenue per permit holder from all landings would have decreased by 5.5 percent to $129,543.

Three hundred and seventy-nine permit holders did not report landings of fish caught within the SAtlE area when it is split into the Charleston Bump area and the East Florida Coast area. The estimated percent change in gross revenues for vessels with this closure is also shown in Table 8.2. The analysis estimates that approximately 30 percent of the vessels that reported landings in 1998 would experience at least a 5 percent decrease in gross revenues with this closure. Approximately 9 percent of the vessels would experience at least a 50 percent decrease in gross revenues (i.e., be forced out of business). The fishermen who reported landings from this area in the pelagic logbook in 1998 had estimated gross revenues from this area ranging from $435 to $161,910 with an average of $36,129 per permit holder. With this closure alone, NMFS estimates that the average gross revenue per permit holder from all landings will decrease by 2.9 percent to $133,114.

The economic impacts on vessel gross revenues of the Charleston Bump and East Florida Coast closures are estimated to be less than the expected economic impacts of the proposed SAtlE closure. Using 1998 data, NMFS estimated that approximately 40 percent of the vessels that reported landings in 1998 would experience at least a 5 percent decrease in gross revenues if the SAtlE area is closed. Approximately 17 percent of the vessels would experience at least a 50 percent decrease in gross revenues (i.e., be forced out of business). The fishermen who reported landings from the SAtlE area in the pelagic logbook in 1998 had estimated gross revenues from SAtlE ranging from $434 to $358,892 with an average of $64,296 per permit holder. If NMFS closed SAtlE year-round, the average gross revenue per permit holder from all landings would have decreased by 11.5 percent to $121,353.

Thus, under the final time/area closure actions, NMFS estimates that, assuming the worst case scenario, the average gross revenues per permit holder could decrease by 4.8 percent to $130,509. Additionally, NMFS estimates that under the final closure actions approximately 43 percent of the vessels that reported landings in 1998 would experience at least a 5 percent decrease in gross revenues and approximately 14 percent of the vessels would experience at least a 50 percent decrease in gross revenues (i.e., be forced out of business).

Table 8.2 The estimated percent change in gross revenues for permit holders under the Draft and Final SEIS.

Reduction in Gross Revenues	Number of Permit Holders	Percent of the 208 Permit holders who reported landings in 1998
Close DeSoto Canyon Area: Final Action		
No change	171	82%
At least a 5% decrease	28	13%
At least a 10% decrease	26	13%
At least a 25% decrease	16	8%
At least a 50% decrease	9	4%
At least a 75% decrease	3	1%
Close Gulf B: Preferred in DSEIS		
No change	155	75%
At least a 5% decrease	48	23%
At least a 10% decrease	45	22%
At least a 25% decrease	34	16%
At least a 50% decrease	11	6%
At least a 75% decrease	3	1%
Close Charleston Bump and East Florida Coast: Final Action		
No change	137	66%
At least a 5% decrease	63	30%
At least a 10% decrease	56	27%
At least a 25% decrease	38	18%
At least a 50% decrease	19	9%
At least a 75% decrease	16	8%
Close SAtlE year-round: Preferred in DSEIS		
No change	123	59%
At least a 5% decrease	83	40%
At least a 10% decrease	79	38%
At least a 25% decrease	59	28%
At least a 50% decrease	34	17%
At least a 75% decrease	27	13%

Reduction in Gross Revenues	Number of Permit Holders	Percent of the 208 Permit holders who reported landings in 1998
Close DeSoto Canyon and SAtlE North and South: Both Final Actions		
No change	106	51%
At least a 5% decrease	89	43%
At least a 10% decrease	80	38%
At least a 25% decrease	56	27%
At least a 50% decrease	28	14%
At least a 75% decrease	19	9%

As mentioned above, this analysis does not examine the positive impact of closing areas on some vessels. If there are a number of fishermen who are unable to land as many fish due to the time/area closure, other fishermen who normally fish in the open areas might have an additional opportunity to land more fish than they previously had before the quota is taken. If that happens, those vessels that land the "extra" fish could have a higher gross revenue than before. In addition, vessels leaving the fishery could receive some compensation by selling their limited access permits. Limited access permits can only be sold for use with similar or smaller-sized vessels as the originally permitted vessel[4]. Preliminary information indicates that some directed permits might be selling for approximately $10,000. Permits for smaller vessels might not be worth as much due to upgrading restrictions for each permit. Also, there might be some vessels that might land more fish at another time in the same area (possible in the Gulf of Mexico only), or land more fish in another area during the closed time period.

In addition, this analysis does not directly examine the economic impact on the captain and crew other than to the extent that the wages of captain and crew come out of the gross revenue for the vessel. NMFS assumes that if the gross revenue of a vessel is reduced by 10 percent, the wages of the captain and crew are also reduced by 10 percent. This is true if the captain and crew receive a constant share of the gross revenue. However, they might receive a percent of the profit rather than a constant share. Under either assumption, however, the final actions could likely have a significant impact on the livelihoods of the captain and crew as well as on the vessel owner.

8.5.3 Results of Gross Revenues Analysis on Dealers

NMFS recognizes that the actual impact of changes in the amount of fish handled by dealers depends heavily on the species, the amount of that species, and the value of that species. However, NMFS feels that these regulations will directly impact the dealers and that a thorough

[4] Under limited access, directed permit holders and swordfish handgear permit holders can transfer permits to vessels that do not exceed 10 percent of the originally permitted vessel's length overall, gross registered tonnage, and net tonnage and 20 percent of the originally permitted vessel's horsepower. NMFS is continuing to collect data and may consider alternate upgrading restrictions, like hold capacity, in the future.

economic analysis of these regulations of dealers is warranted. These analyses are discussed below.

In the database used for this analysis, there were 125 dealers identified by the 450 vessels on their weighout slips for the pelagic logbook. The total weight of fish handled by each dealer who bought fish from the fishermen who qualified for a directed or incidental swordfish limited access permit in 1998 ranged from 59 lb dw to almost 900,000 lb dw. The impact of closing each time/area option on the total weight of fish handled is shown in Table 8.3. The gross revenues obtained from selling swordfish ranged from $129 to over $3.4 million and averaged $192,483 per dealer. The gross revenues obtained from selling yellowfin tuna ranged from $223 to over $2.5 million and averaged $191,675 per dealer.

Twenty-five dealers (out of the 125 who bought fish from qualifying permit holders) reported receiving fish caught in the DeSoto Canyon from the 450 swordfish limited access permit holders. The amount of fish received by these 25 dealers ranged from 397 pounds to 61,470 pounds and averaged 11,480 pounds per dealer. NMFS estimates that with the DeSoto Canyon closure, the average weight of fish handled per dealer would decrease by 0.4 percent to 82,761 pounds. The amount of gross revenues received from swordfish received from the DeSoto Canyon ranged from $129 to $85,444 and averaged $20,373. With the closure, the average gross revenues from swordfish could increase by 1 percent to $194,382. The amount of gross revenues received from yellowfin tuna received from the DeSoto Canyon ranged from $2,166 to $232,139 and averaged $51,504. With the closure, the average gross revenues from yellowfin tuna could decrease by 4 percent to $183,934.

Twenty-one dealers (out of the 125 who bought fish from qualifying permit holders) reported receiving fish caught in the proposed GulfB closure from the 450 swordfish limited access permit holders. The amount of fish received by these 21 dealers ranged from 84 to 168,407 pounds and averaged 39,531 pounds per dealer. NMFS estimates that if the Gulf B area was closed, the average weight of fish handled per dealer would decrease by 7.3 percent to 76,999 pounds. The amount of gross revenues received from swordfish received from the Gulf B area ranged from $613 to $122,691 and averaged $24,003. If this area was closed, the average gross revenues from swordfish could decrease by 0.3 percent to $191,849. The amount of gross revenues received from yellowfin tuna received from the Gulf B area ranged from $11,878 to $732,729 and averaged $183,524. If this area was closed, the average gross revenues from yellowfin tuna could decrease by 17.2 percent to $158,658. This is considerably more than the four percent reduction estimated with the DeSoto Canyon area closure.

Forty-three dealers (out of the 125 who bought fish from qualifying permit holders) reported receiving fish caught in the Charleston Bump and East Florida Coast closures from the 450 swordfish limited access permit holders. The amount of fish received by these 43 dealers ranged from 47 to 116,907 pounds and averaged 17,306 pounds per dealer. NMFS estimates that with the Charleston Bump and East Florida Coast closures, the average weight of fish handled per dealer would decrease by 2.5 percent to 80,990 pounds. The amount of gross revenues received

from swordfish received from the Charleston Bump and East Florida Coast closures ranged from $225 to $509,723 and averaged $75,102. With the closure, the average gross revenues from swordfish could decrease by 8.5 percent to $176,056. The amount of gross revenues received from yellowfin tuna received from the Charleston Bump and East Florida Coast closures ranged from $223 to $55,644 and averaged $8,243. With the closure, the average gross revenues from yellowfin tuna could increase by 2.1 percent to $195,731.

Fifty-seven dealers (out of the 125 who bought fish from qualifying permit holders) reported receiving fish caught in the proposed SAtlE closure from the 450 swordfish limited access permit holders. The amount of fish received by these 57 dealers ranged from 21 to 262,247 pounds and averaged 26,726 pounds per dealer. NMFS estimates that if the proposed SAtlE area was closed, the average weight of fish handled per dealer would increase by 0.6 percent to 83,597 pounds. The amount of gross revenues received from swordfish received from the proposed SAtlE area ranged from $158 to over $1.1 million and averaged $111,163. If this area was closed, the average gross revenues from swordfish could decrease by 11 percent to $171,943. The amount of gross revenues received from yellowfin tuna received from the proposed SAtlE area ranged from $218 to $57,180 and averaged $10,403. If this area was closed, the average gross revenues from yellowfin tuna could increase by 11 percent to $212,563. Again, these reductions are greater than those estimated for the final closure options.

These analyses indicate that both the final closures and the proposed closures could have a significant economic impact on a substantial number of dealers. However, the final closures will have less of an economic impact to many dealers. While 14 percent of the dealers could experience at least five percent reduction in the amount of fish handled due to the DeSoto Canyon area closure, 15 percent could experience the five percent reduction if the Gulf B area was closed (Table 8.3). Also, while 28 percent could experience at least five percent reduction in the amount of fish handled due to the Charleston Bump and East Florida Coast closures, 39 percent could experience the five percent reduction if the proposed SAtlE area was closed (Table 8.3).

As with the analysis for gross revenues of individual vessel permit holders, this analysis does not examine the positive impacts of the closures on some dealers. While dealers near the closed areas might lose business from pelagic longline fishermen, these dealers might be able to focus activities on other fish products. Also, dealers outside the closed areas are likely to obtain additional fish from pelagic longline fishermen and therefore might increase gross revenues. Many dealers, unlike fishermen, do not have any limited access permits to sell as compensation if they are forced out of business. Thus, many dealers will not have any means of compensation (e.g., selling their permits) if they decide to leave the fishery.

Table 8.3 The estimated percent change in weight of fish handled (A), in gross revenues from swordfish (B), and in gross revenues from yellowfin tuna (C) by 125 dealers under the draft and final SEIS.

(A) Percent change in weight of fish handled

Percent Reduction in Total Weight of Fish Handled	Number of Dealers	Percent of the 125 Dealers who bought fish from qualifying permit holders
Close DeSoto Canyon Area: Final Action		
No change	98	78%
At least a 5% decrease	17	14%
At least a 10% decrease	13	10%
At least a 25% decrease	8	6%
At least a 50% decrease	7	6%
At least a 75% decrease	3	2%
Close Gulf B: Preferred in the DSEIS		
No change	102	82%
At least a 5% decrease	19	15%
At least a 10% decrease	19	15%
At least a 25% decrease	11	9%
At least a 50% decrease	3	2%
At least a 75% decrease	1	1%
Close Charleston Bump and East Florida Coast: Final Action		
No change	80	64%
At least a 5% decrease	35	28%
At least a 10% decrease	28	22%
At least a 25% decrease	19	15%
At least a 50% decrease	13	10%
At least a 75% decrease	8	6%
Close SAtlE year-round: Preferred in the DSEIS		
No change	66	53%
At least a 5% decrease	49	39%
At least a 10% decrease	46	37%
At least a 25% decrease	42	34%
At least a 50% decrease	35	28%
At least a 75% decrease	29	23%

(B) Percent Reduction in Gross Revenues from Swordfish

Percent Reduction in Gross Revenues from Swordfish	Number of Dealers	Percent of the 114 Dealers who bought Swordfish from qualifying permit holders
Close DeSoto Canyon Area: Final Action		
No change	95	83%
At least a 5% decrease	12	11%
At least a 10% decrease	10	9%
At least a 25% decrease	7	6%
At least a 50% decrease	7	6%
At least a 75% decrease	5	4%
Close Gulf B: Preferred in DSEIS		
No change	94	82%
At least a 5% decrease	18	16%
At least a 10% decrease	14	12%
At least a 25% decrease	7	6%
At least a 50% decrease	4	4%
At least a 75% decrease	3	3%
Close Charleston Bump and East Florida Coast: Final Action		
No change	74	65%
At least a 5% decrease	37	32%
At least a 10% decrease	30	26%
At least a 25% decrease	19	17%
At least a 50% decrease	12	11%
At least a 75% decrease	7	6%
Close SAtlE year-round: Preferred in DSEIS		
No change	61	54%
At least a 5% decrease	50	44%
At least a 10% decrease	46	40%
At least a 25% decrease	40	35%
At least a 50% decrease	35	31%
At least a 75% decrease	27	24%

(C) Percent Reduction in Gross Revenues from Yellowfin Tuna

Percent Reduction in Gross Revenues from Yellowfin tuna	**Number of Dealers**	**Percent of the 96 Dealers who bought Yellowfin tuna from the qualifying permit holders**
Close DeSoto Canyon Area: Final Action		
No change	78	68%
At least a 5% decrease	11	10%
At least a 10% decrease	10	9%
At least a 25% decrease	7	6%
At least a 50% decrease	3	3%
At least a 75% decrease	1	1%
Close Gulf B: Preferred in DSEIS		
No change	77	68%
At least a 5% decrease	19	17%
At least a 10% decrease	18	16%
At least a 25% decrease	12	11%
At least a 50% decrease	4	4%
At least a 75% decrease	2	2%
Close Charleston Bump and East Florida Coast: Final Action		
No change	72	63%
At least a 5% decrease	18	16%
At least a 10% decrease	14	12%
At least a 25% decrease	7	6%
At least a 50% decrease	4	4%
At least a 75% decrease	3	3%
Close SAtlE year-round: Preferred in DSEIS		
No change	64	56%
At least a 5% decrease	29	25%
At least a 10% decrease	25	22%
At least a 25% decrease	19	17%
At least a 50% decrease	15	13%
At least a 75% decrease	14	12%

8.5.4 Impacts of the Prohibition of Live Bait on Commercial Vessel Gross Revenues

A quantitative analysis is difficult for the live bait prohibition because it is unknown how much this final action could alter the landings of pelagic longline fishermen (see Section 7 for a discussion of bait practices). An evaluation of live bait sets versus dead bait sets in logbooks indicates that only 13 percent of all sets made in the Gulf of Mexico between 1992 and 1998 used live bait and most of these were made in the western Gulf of Mexico (Scott *et al*., 2000). The same evaluation on observer data resulted in a similar finding with 21 percent of all observed sets using live bait and the majority of those were made in the western Gulf of Mexico (Scott *et al*., 2000). While a prohibition of live bait may reduce the landings of some pelagic longline fishermen, particularly yellowfin tuna landings, it is not likely that this final action will have a large impact on the gross revenues of any permit holder. More likely, this final action may have an impact on the net revenues of some permit holders since it will change the method of fishing.

8.5.5 Impacts of Final Actions on Commercial Fishing Costs

All of the alternatives examined in the DSEIS, except for no action, could have an impact on the fishing costs of individual vessels. An analysis of costs for each individual vessel cannot be performed due to the lack of economic data as well as the difficulty in predicting the strategy of individual fishermen. However, based on some studies performed on the voluntarily reported economic logbook records, some generalizations can be made on potential impacts.

Ward and Hanson (1999) evaluated the logbooks and weighout forms and found that the average cost per pelagic longline trip in 1998 was $3,737. Twenty-nine percent of this came from fuel, 22 percent from buying bait, 15 percent from groceries, 12 percent from both freight and handling and ice, and 10 percent from light sticks. They also found that the average gross revenues for the 6,662 trips between 1996 and 1997 was $118,804. Despite this large average gross revenue, the average annual net return to each vessel was only $7,097 with the majority of the fleet earning low to negative income (20 percent of the vessels). However, 107 vessels did have total net returns of over $10,000 including 39 vessels that had total net returns ranging between $50,000 and $100,000 and 6 vessels that had total net returns greater than $120,000.

Given this information, the final time/area closure options could have a large impact on fishing costs and could force many fishermen to exit the fishery because there is little room for any increases in costs or decreases in gross revenues. The time/area closures could require a number of fishermen who wish to remain in the fishery to move their operations to different areas either permanently or for part of the year in order to continue fishing. The open fishing areas could be "new" to these fishermen and therefore, fishermen might not be as productive until they familiarize themselves with the new area. Moving their fishing operations could likely increase the cost of fuel, bait, ice, food, and crew wages as the number of days at sea traveling to and from fishing grounds might increase. In addition, the gross revenue analysis described above indicates

the time/area closures will likely reduce the average gross revenues of permit holders by 4.8 percent. This will further reduce the annual net return to vessel owners. If NMFS assumes that a reduction in average gross revenues of 4.8 percent also reduces the average annual net return by 4.8 percent, annual net returns could be reduced by $341 to $6,756. It is likely that fishing costs could increase if fishermen need to buy additional fuel, thus further reducing the average annual net return.

Requiring the use of dead bait instead of live bait might increase costs for fishermen who currently use live bait. Currently, fishermen who use live bait catch the bait themselves and keep it alive in holding tanks instead of buying dead bait before the trip. If these fishermen were required to use dead bait, they might begin to buy bait instead of fishing for it. Ward and Hanson, 1999, found that on average dead bait accounted for 22 percent or $646 of the fishing costs per trip. Thus, fishermen who decide to buy dead bait could have their initial fishing costs increase by 22 percent. However, the use of dead bait might decrease the time at sea (since a number of days are used up fishing for live bait). A decrease in the time spent at sea might decrease the cost of fuel, groceries, or the amount of the revenues used to pay the crew for their time. Additionally, this regulation might eliminate any costs associated with catching the bait and keeping it alive. Thus, even though fishermen might need to spend additional money up front in order to leave for a fishing trip, this alternative might be beneficial in the long term because they would not have to buy as much food, fuel, or ice in order to make a trip and they could spend more time on the sea fishing for target species.

Alternately, some fishermen who currently fish with live bait might continue to fish for their bait instead of switching to frozen bait. The costs for these fishermen might be slightly lower than before the regulation as they would no longer have to keep bait alive.

8.5.6 Economic impacts on the Recreational Fishing Sector

Numerous comments were received that the recreational fishing sector provides many economic benefits throughout the fishing industry and beyond. One commentor noted that he and several friends spend upwards of $62,000 annually in order to fish recreationally for billfish. This figure included hotels, airline tickets, and charter/headboat reservations. Other commentors noted that one tournament brings in more money to local economies than commercial fishing does all year.

Unlike commercial fishing where analyses focus on gross or net revenues and fishing costs, analyses on recreational fishing focus on expenditures or the amount anglers are willing to pay to go recreational fishing. At this time, NMFS does not have extensive estimates, besides those described in the HMS FMP or Billfish FMP Amendment, on how much money recreational fishermen spend, or are willing to spend, on fishing. The HMS FMP estimates that charter/headboat trips targeting bluefin tuna cost the average angler approximately $260 and that the gross revenues from bluefin tuna fishing for all charter/headboat operators is approximately $5.3 million per year. The HMS FMP also estimates that anglers are willing to pay approximately $1,000 per trip above the total trip costs in order to go fishing for BAYS tunas.

The Billfish FMP Amendment found that in 1992 billfish anglers spend approximately $2,147 per trip to participate in a billfish tournament. The Billfish FMP Amendment notes that a similar study in 1994 found that non-resident billfish anglers spent $2,132 per billfish caught in a tournament and resident anglers spent approximately $1,963 per billfish caught at a tournament. Additional estimates can be found in Section 7 of this document.

It is likely that as overfished stocks recover and a greater number of adult fish become available, recreational fishermen would be willing to spend a greater amount of money in order to fish. It is also likely that recreational fishermen may be willing to spend more money if they do not have to compete with commercial fishermen for space. In this respect, the final actions will likely benefit businesses which rely on recreational fishing participants. In addition, communities in the closed area that used to rely on commercial fishing may switch effort to recreational fishing. However, the final actions will not have any other direct impacts on the recreational fishing sector.

8.5.7 Alternatives designed to Minimize Significant Economic Impacts of these Regulations and a Statement as to why Other Alternatives were Rejected

One of the requirements of a FRFA is to describe the steps the Agency has taken to minimize the significant economic impact of the regulations on the small entities, list the alternatives considered by the agency, and explain why other alternatives were rejected. NMFS recognizes that these regulations, particularly the time/area closures, will have a significant economic impact on a substantial number of fishermen, dealers, and other business that rely on commercial fishing. In order to minimize these impacts, NMFS examined a number of other alternatives (the rejected and not selected alternatives described in Section 7) and a number of variations on the closures originally proposed in order to reduce bycatch and bycatch mortality without significantly impacting the landings of target species. In addition, after the first comment period, NMFS performed additional analyses on the efficacy of live versus dead bait and on the DeSoto Canyon area in an attempt to minimize the economic impacts. A full description of each alternative, its expected impacts, and the agency's reasons for either selecting, not selecting, or rejecting it is contained in Section 7 of this document. NMFS believes the final actions will meet the objectives of the regulations (for some species the final actions are estimated to have a more positive conservation benefit than the alternatives preferred in the DSEIS) and also minimize the economic impacts the commercial fishing sector is likely to experience. In addition, NMFS decided to delay the effectiveness of some actions in order to minimize some of the economic impacts and give commercial fishermen and related businesses a chance to relocate. However, despite NMFS' efforts, many commercial fishermen and people in related industries are likely to lose a significant portion of their income and may decide to leave the fishery all together or go out of business.

Many comments on the proposed rule and on the supplementary information regarding the DeSoto Canyon focused on the social and economic effects of this rule, and the need for

economic compensation and/or relief. NMFS recognizes that this time/area rule will have a significant economic impact on a substantial number of participants, and that the ripple effects of the rule will go beyond the immediate community of fishermen, and affect fishing families, associated businesses, and the larger coastal economy.

NMFS has also decided to delay implementation of some of the regulations in an attempt to offset some of the impacts fishermen may have as a result of the time/area closures and to give fishermen and related industries a chance to relocate both business interests and family[5]. Thus, NMFS is implementing the DeSoto Canyon closure 90 days after publication of the final rule. Unlike the closure in the Atlantic, this closure does not follow the coastline of any states, so NMFS believes that many fishermen may still be able to fish from their current homeports and may decide not to relocate or to decide to move a relatively short distance. However, the East Florida coast closure encompasses a larger area and the entire coastline of Florida. Thus, NMFS feels that more businesses will be impacted and will decide to move farther away from their current homeports. In order to allow them to continue to fish while they search for a new area to fish or move, NMFS believes a 180-day delayed implementation is justifiable. In addition, this delay will allow both the Charleston Bump and East Florida closures to begin on the same day. This may prevent any confusion over the regulations.

8.6 Regulatory Impact Review

The RIR provides analyses of the net benefits and costs to the nation of each alternative. Most of the benefits and costs of the alternatives are discussed in Sections 7 and 8.5 of this document. This section provides only a brief summary of the overall impacts of the alternatives.

8.6.1 Possible Changes in Gross Revenues

The estimates shown in the RIR for the impact of the time/area closures are based on the analyses performed in the FRFA above. For each species, NMFS summed the gross revenues for each vessel to arrive at the total gross revenues in the pelagic longline fishery. NMFS then examined the impact of the closure if the fish were lost because of the time/area closure. NMFS used a similar analysis on the dealer information. This type of analysis indicates the maximum amount of gross revenues which could be lost because of a time/area closure. In reality, the opportunity to catch and land the quota is not changed by this rule. Some fish might not be landed if vessels are unable to move to open fishing areas but the gross revenues from the fishery should not be reduced significantly.

Total gross revenues from all fishing activities in the Atlantic of the 208 vessels that reported in the pelagic logbook in 1998 reached $28.5 million, ranged from $435 to $668,135, and averaged $137,126 per vessel. Total gross revenues from all fishing activities in the DeSoto Canyon of the

[5] The Florida Association of Realtors (pers. communication) feel it takes approximately 3 to 6 months to sell a home in Florida.

37 vessels that reported in the pelagic logbook in 1998 totaled $638,380, ranged from $681 to $85,959, and averaged $17,253 per vessel. With the DeSoto Canyon closure, NMFS estimates that the total gross revenue from the 208 vessels would decrease by 2.2 percent to $27.9 million and the average gross revenue per vessel would decrease by 1.8 percent to $134,705. With the final SAtlE closure, NMFS estimates that the total gross revenue from the 208 vessels would decrease 9 percent to $26.0 million and the average gross revenue per vessel would decrease by 2.9 percent to $133,115. Together, NMFS estimates that the two closures will reduce the total gross revenue for the 208 vessels by 11.2 percent to $25.3 million and reduce the average gross revenues by 4.8 percent to $130,509.

Using the wholesale prices from the Fulton Fish Market, NMFS estimates that with the DeSoto Canyon closure, total gross revenues from swordfish for the dealers who reported handling swordfish in 1998 would decrease by 1.7 percent from $21.9 million to $21.6 million. However, the average gross revenues per dealer would increase by 1 percent from $192,483 to $194,382. NMFS attributes any increase in average gross revenues to marginal dealers leaving the business as a result of the closure. In other words, this average would include only the more profitable firms that did not go out of business. Of the dealers who reported handling yellowfin tuna in 1998, total gross revenues from yellowfin tuna would decrease by 5 percent from $18.4 million to $17.4 million. The average gross revenues per dealer from yellowfin tuna would also decrease by 4 percent from $191,675 to $183,934.

NMFS also estimates that with the Charleston Bump and East Florida Coast closures, total gross revenues from swordfish from the dealers that reported handling swordfish in 1998 would decrease by 13.3 percent to $19 million and the average gross revenues per dealer would decrease by 8.5 percent to $176,056. Of the dealers who reported handling yellowfin tuna in 1998, the Charleston Bump and East Florida Coast closures would decrease total gross revenues from yellowfin tuna by 1.1 percent from $18.2 million. The average gross revenues per dealer from yellowfin tuna would also increase by 2.1 percent from to $195,731.

Catch data from the pelagic longline logbook program are summarized in the Large Pelagic Logbook Newsletter published annually by the NMFS' Southeast Fisheries Science Center. The 1998 catch of the major species retained from East Florida Coast and the South Atlantic Bight, combined, and the Gulf of Mexico are noted in Table 8.4. These data are based on pelagic longline sets, as bottom longline sets are removed from the database prior to analysis. Other species such as bluefin tuna and marlins are not reported in this table as they are not retained (except for small amounts of bluefin tuna per the target catch requirements) and as such do not directly affect the income of the fishermen. Note that the Logbook Newsletter does not include data on other retained catches, including dolphin, wahoo, and sharks, and thus certain potentially important sources of income are not included in the data.

Table 8.5 represents the approximate gross revenue composition of pelagic longline fishermen based on the data in Tables 8.1 and 8.4. Numbers of individual fish are multiplied by the average dressed weight and price to obtain each species' share in overall gross revenues. Larkin *et al.*

(1998) note that the composition of fleet gross revenues are as follows: swordfish 45 percent, BAYS tunas 39 percent, dolphin 13 percent, LCS 1 percent, Other 2 percent. These numbers are based on 1996 data collected through the voluntary economic add-on questionnaire. Under the final actions, it is likely that the gross revenues from these species in the closed area could decrease. It is also possible that the species composition might change as different areas are fished.

Table 8.4 **The catch composition of pelagic longlines, by area, in numbers.** Source: Cramer and Adams, 2000. These data are found in Table 1c of the Large Pelagic Logbook Newsletter, 1998. The catch for swordfish and yellowfin reported in Table 1c is adjusted by the percentage kept reported in Table 3c in order to calculate the actual number of fish landed.

Species	East Florida Coast and South Atlantic Bight	Gulf of Mexico
Swordfish	23,501	8,821
Yellowfin tuna	2,474	36,099
Bigeye tuna	3,227	406
Albacore tuna	3,969	82

Table 8.5 **Gross revenues of pelagic longline fishermen from each species**.

Species	Gross Revenues in East Florida Coast and South Atlantic Bight	Gross Revenues in Gulf of Mexico
Swordfish	$5,110,600 (84%)	$1,918,242 (28%)
Yellowfin tuna	$325,163 (5%)	$4,744,571 (70%)
Bigeye tuna	$584,975 (9%)	$73,598 (1%)
Albacore tuna	$89,992 (1%)	$1,859 (>1%)

In Section 7, Table 7.9 describes the potential impact on target species under the effort redistribution and no effort redistribution models for the final action. These tables indicate that under the final actions (closing the DeSoto Canyon, Charleston Bump, and East Florida Coast) using the effort redistribution model, there might be a maximum increase of just under $3 million in ex-vessel gross revenues from the fishery. Likewise, under the alternatives preferred in the DSEIS (closing GulfB and SAtlE) there might be a maximum increase the ex-vessel gross revenues from the fishery by just over $3 million. These tables, which consider effort redistribution, indicate that the fishery as a whole could benefit as a result of the final time/area closure alternatives. Thus, models that incorporate effort redistribution are more optimistic than the other models presented in this section. This is because the other models presented in this section assume that the fish normally landed in the areas and times closed are lost to everyone. This is not realistic but does indicate the maximum reductions possible to the fishery.

One of the comments received included economic analyses conducted by the SC Department of Natural Resources staff. According to this analysis, SC fishermen currently have an aggregate income of $365,000 (including captain, crew, and owner shares). Currently, fishing sales in South Carolina account for $911,300 and fishing income $280,600. This analysis found that as a

result of the proposed closure, SC revenue from fishing sales could decrease to $547,100 and fishing income could decrease to $110,800. In addition, the analysis estimated that South Carolina could lose over $20,000 in state taxes.

8.6.2 Possible Changes in Fishing Costs

Fishing costs data for pelagic longline fishermen have been compiled from data from the voluntary economic add-on to the logbook reporting form. Larkin *et al.* (1998) report on results of economic data add-on for 1996, indicating that average fuel cost per trip were $1,400, or approximately 19 percent of total variable costs per trip (excluding labor costs, which are calculated as a share of net returns). Fuel is second only to bait in costs of fishing. The authors note the high standard deviation associated with this average fuel costs figure, indicating that for the majority of trips, $68-$479 is spent on fuel; average values are thus overestimated due to the influence of a few high values. These results are different than the results found by Ward and Hanson (1999) (see section 8.5.5 above), using more updated data. However, both studies found high standard deviations. A commentor who provided cost information also agreed that fuel accounted for a large percentage of the cost per trip. This commentor suggested that in South Carolina one trip costs the fisherman $0.85 per lb of fish landed and that $0.40 per lb is paid to the dealer.

As a result of the time/area closure and the prohibition on live bait, the cost of fishing to fishermen might very well increase. Thus the cost of fishing in the entire fishery might increase. In addition, those vessels and dealers who decide to relocate will incur a one time cost of moving. However, if costs increase for the fishermen, related businesses are likely to benefit through increased revenues. Also, the benefits to related businesses outside of the closed area may increase substantially if commercial fishermen relocate and the benefits to recreational fishermen may increase if user conflicts decrease. Given the difficulty in predicting fishermen's behavior, NMFS is unable to give exact estimates of the total impact of fishing costs on the fishermen or the associated benefits to related businesses for any of the alternatives or final actions. However, given the estimates described in the above analyses, NMFS believes that the benefits and costs of the final actions to all of the various businesses in the fishing industry could be offset to some extent.

8.6.3 Summary of Net Benefits

NMFS does not believe that the national net benefits and costs to the nation would change significantly in the long run as a result of implementation of the final actions. The benefits and costs of parts of the industry might change and the volume of certain species might change slightly but the total volume of fish should not change significantly. In addition, over time, the final actions should help rebuild the overfished stocks of swordfish, billfish, and other species. As stocks are rebuilt, the benefit the nation receives from these species increases. Table 8.9 indicates possible changes as a result of each alternative.

Table 8.6 Summary of benefits and costs for the final actions.

Action	Net Economic Benefits	Net Economic Costs
Close DeSoto Canyon, East Florida Coast, and Charleston Bump: Final action	Reduce bycatch and incidental catch of some species. This may allow some species to rebuild faster. Some businesses might benefit from commercial fishermen buying additional supplies in order to fish outside the closed areas. Recreational fishermen will have fewer conflicts with commercial fishermen in open areas, which may increase the incentive for them to spend more money in communities near closed areas.	Commercial fishermen and related industries would need to spend money to move to different areas. If commercial fishermen move to different areas, entire communities could shift to recreational fishing or collapse.
Prohibit use of live bait on pelagic longlines in the Gulf of Mexico: Final action	Reduce billfish catches on pelagic longline gear. Commercial fishermen who were using live bait can spend more time each trip fishing for target species. Bait houses could have additional customers.	Commercial fishermen using live bait may need to spend the money to buy frozen bait. Catch rates of target species (YFT) might decline.

8.7 Issues raised during the Comment Periods, the Response of the Agency, and Changes made as a Result of these Issues

NMFS held two comment periods, 13 public hearings, and two joint HMS and Billfish AP meetings for this rulemaking. During this time, NMFS received several hundred comments and over 2,000 form letters. Many of the comments received mentioned the social and economic benefits and costs of the proposed actions. A summary of these comments and NMFS' responses can be found in Appendix B of this document. The comments that explicitly relate to the IRFA or the RIR are found under the headings "Mitigation of Economic Impacts" and "Social and Economic Evaluations."

As described throughout this document, NMFS changed the proposed rule as a result of many of the concerns raised in the comment period. The rationale for and impacts of these changes are described in Sections 7, 8, 9, and Appendix B of this document. In many cases, the changes were made to mitigate the social and economic impacts identified by commercial and recreational fishermen during the comment periods. The changes are listed in Table 8.7.

Table 8.7 Changes to the Final Regulations from the Proposed Regulations

Preferred Alternative in DSEIS	Final Action in FSEIS
Close Gulf B (Western Gulf of Mexico) from March through September	Close DeSoto Canyon Area year-round; Delay implementation for 90 days (November 1, 2000)
Close entire SAtlE (Southern FL to NC) year-round	Split this region and close East Florida Coast year-round and close Charleston Bump February through April; Delay implementation for 180 days (February 1, 2001)
No gear restriction	Prohibit live bait in Gulf of Mexico; Delay implementation for 30 days (September 1, 2000)

8.8 Possible Economic Impacts of a Closure of the Grand Banks

As indicated in Section 5.8, a draft Biological Opinion (BO), issued in early June 2000, concluded that the continued operation of the Atlantic pelagic longline fishery is likely to jeopardize the continued existence of loggerhead sea turtles. Pending further analyses, the final BO could include a jeopardy finding on leatherback sea turtles as well. NMFS anticipates completion of the final BO by late June, and will initiate implementation of the BO, including appropriate regulatory actions, at that time. To avoid jeopardy, NMFS must implement reasonable and prudent alternatives (RPAs) to reduce the number of sea turtles that are incidentally captured, injured, or killed by gear in federally-managed fisheries by at least 75 percent (this percentage might change in the final BO). If NMFS cannot develop measures to achieve this result, it must implement the RPAs contained in the final BO. The RPAs in the draft BO include modifications in fishing method (e.g., timing of sets and water temperature), gear modifications (e.g., corrodible hooks), exclusion zones (i.e., time/area closures), and monitoring. The time/area closure alternative suggests a closure of Grand Banks area from September through December. NMFS expects that the time/area closure could have the most significant economic impacts. At this time, NMFS has not had the chance to examine fully the impacts of the RPAs or to complete analyses that would indicate exactly what the closure area may be (if NMFS decides to implement that RPA) or the dates of such a closure. Without this information, NMFS cannot conduct as full an analysis as it has done for these regulations. However, due to the possibly large economic and social impacts of the combination of this final rule and any addition closures, NMFS feels that it is important to discuss the possible economic impacts of a Grand Banks closure in relationship to the final actions in this document.

Cramer and Adams (2000) present information on the activities of vessels in the North East Distant Area (20°W to 60°W longitude and 35°N to 55°N latitude). For the purposes of this discussion, NMFS is assuming that the Grand Banks time/area closure would be synonymous with the North East Distant statistical area. If NMFS implements this alternative, the actual closure may be this entire area or may be a subset of it. Using Cramer and Adams (2000) and the price and weight information in Table 8.1 of this document, NMFS has compiled some summary information on the activities and average gross revenues of these vessels. This information can be found in Table 8.8.

While Table 8.8 indicates some of the general trends in the fishery, it does not show the entire picture. The information presented does not indicate seasonal trends (which are important in order to assess the effects of a closure from September to December), does not indicate other areas where these vessels fish (NMFS expects that many of these vessels fish in other areas such as the Caribbean or mid-Atlantic Bight when they are not fishing on the Grand Banks), and does not indicate the other species these vessels may land (NMFS expects that fishing on the Grand Banks targets mainly swordfish, but these vessels may target other species in other locations). Nevertheless, this table does indicate that fishing the Grand Banks annually provides for a large portion of U.S. swordfish, especially considering the relatively small number of vessels fishing the area. This table also indicates that the vessels fishing on the Grand Banks could have higher average gross revenues from swordfish than the other vessels in the fleet. However, these larger vessels may require the higher productivity of the Grand Banks in order to cover operating costs.

Thus, NMFS expects that a seasonal closure of the Grand Banks could have a large economic impact on at least the owners and crew of the 15 vessels that fished the Grand Banks in 1998 and possibly on the pelagic longline fishery as a whole. However, NMFS does not expect that a Grand Banks closure would have a large economic or social impact on the fishermen and related industries who are directly affected by the final actions in this document. Rather, NMFS believes that the vessels that are likely to be affected by the Gulf of Mexico and Southeast Atlantic time/area closures do not fish the Grand Banks currently and do not have the type of vessel that could make a trip to the Grand Banks safely. Nevertheless, to the extent that a few of the vessels affected by this final rule might shift effort into the Grand Banks, the combination of this final rule and a closure of the Grand Banks could have large economic impacts.

Table 8.8 **Summary information on vessels that fished in the Grand Banks.** Source: Cramer and Adams, 2000. Note: 1998 data are preliminary.

	1996	1997	1998
Number of vessels active in the entire Atlantic fleet	264	257	210
Number of vessels active in the Grand Banks	22	22	15
Number of Grand Banks Swordfish kept by vessels fishing the Grand Banks	12,632 (17.2% of the total amount kept by fleet)	12,786 (18.8% of the total amount kept by fleet)	13,122 (19.5% of the total amount kept by fleet)
Total Gross Revenues from Grand Banks Swordfish kept by vessels fishing the Grand Banks	$2,747,081	$2,780,379	$2,853,473
Average Gross Revenues per vessel from Grand Banks Swordfish kept by vessels fishing the Grand Banks	$124,867 ($60,428 is average for the total amount kept by the fleet)	$126,381 ($57,666 is average for the total amount kept by the fleet)	$190,232 ($69,671 is average for the total amount kept by the fleet)

8.9 Conclusion

NMFS concludes that the final actions in this document will have a significant economic impact on a substantial number of small entities as defined under the Reg Flex Act. In fact, a number of small entities, both fishermen and businesses related to fishing (e.g., dealers) could be forced out of business. However, NMFS also concludes that, because the final actions do not change the quota for any fishery, the type of gear that can be used to take the quota (although the final action does restrict the use of the gear), or the amount of time allotted to take the quota, these final regulations do not constitute a significant rule under E.O. 12866.

Although this action will significantly affect a number of small businesses (commercial fishermen, vessel owners, dealers, etc.), the action should reduce the bycatch and incidental catch of species in the pelagic longline fishery, to the extent practicable. With reduced bycatch and incidental catch and with the current rebuilding plans, the stocks of fish and protected species will have a greater chance to rebuild and may rebuild faster. When the stocks are rebuilt and mature fish of the target species are more abundant, there are benefits to U.S. commercial fishermen, consumers, recreational fishermen, and to the nation as a whole. In addition, the final actions could have positive impacts on the recreational fisheries for HMS such as reduced user-conflict and increased angler satisfaction. However, if the stocks continue to decline or if they remain at current levels, the fishermen and everyone involved in the fishery could suffer additional hardships and might be forced to leave the fishery. Thus, NMFS believes that the regulations are necessary and will benefit all stakeholders in the long term.